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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/559,749	04/27/2000	William J. Imochl	051252-5065	2942

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EXAMINER

COMPTON, ERIC B

ART UNIT	PAPER NUMBER
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3726

DATE MAILED: 05/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/559,749

Applicant(s)

Imoehl

Examiner

Eric Compton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Apr 18, 2002
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-4 and 6-10 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-4 and 6-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other: _____

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DETAILED ACTION

Continued Examination under 37 CFR 1.114 After Final Rejection

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 18, 2002, has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 2, 6 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by DE 2912814 to Grimm (GEHRING).

Regarding claim 7, Grimm discloses a fuel injector valve seat having an orifice portion proximate a downstream face and having a first transverse cross-sectional area, a sealing portion

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(3) proximate an upstream face and having a second cross-sectional area, and a transition portion (no reference) interposed between the orifice portion and the sealing portion.

Figure 2 shows the sealing portion and the transition portion decreasing from one area to another and the conical surfaces inherently have an included angle. Furthermore, the first angle is clearly greater than the second angle.

The flow characteristics (i.e. fluid dynamics) of the fuel injector are based on geometrical variables (e.g. cross-sectional areas, lengths, diameters, angles, etc.). Therefore, prior to forming a fuel injector, it is inherent that these variables have been predetermined by the designer(s) to yield specific flow characteristics in the finish product.

Grimm is concerned specifically with finishing the sealing face (3) of the fuel injector by a grinding operation using a rotary tool (6) to provide a select finish on the sealing portion (3). As shown in Figure 2 the rotary tool (6) is rotated about an axis of rotation parallel to the axis of the fuel injector seat. Furthermore, the tool includes a conical end with a vertex of the conical end disposed on the transition portion. It can clearly be seen that the transition portion provides a volume receiving the vertex of the tool so that the vertex avoids contact with the sealing surface and with the transition portion.

Regarding claim 6, as shown in Figure 2 of Grimm the grinding tool is driven in rotation about an axis.

Regarding claim 2, as shown in Figure 2 of Grimm, the first angle is clearly greater than the second angle.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-4 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grimm.

Grimm discloses the invention cited above. However, the reference does not specifically disclosed the included angles values claimed by Applicant. However, in the reference the first angle appears to be in the neighborhood of 90 degrees. Furthermore, in the first angle is greater than the second angle. The angles affect the flow through the injector.

Similarly, the reference does not specifically disclose a ratio of the first-transverse cross-sectional area over the first area. This ratio is equal to the outer (i.e. larger) diameter of the sealing portion over the diameter of the orifice portion. Again, the dimensions of the passageways affects the mass flow through the injector.

Therefore, regarding claims 3-4, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected specific diameters and included angles of the fuel injector of Grimm, since it has been held that discovering an optimum value of a

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result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 8-10, although select finishes of 0.2-0.5 micrometers are not explicitly disclosed by the references cited, Official Notice is taken that grinding to such a finish is known in the art of manufacturing valve seats.

Response to Arguments

6. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Prior Art References

7. The prior art references listed on the enclosed PTO-892, but not used in a rejection of the claims, are cited for their teachings of forming fuel injectors.

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Contact Information

8. Official documents related to the instant application may be submitted to the Technology Center 3700 mail center by facsimile at (703) 305-3579/3580. Should Applicant desire to submit a DRAFT response to the Examiner by facsimile transmission, then Applicant should contact the Examiner at the number below for instructions concerning the transmission of DRAFT documents. Applicant is reminded to clearly mark any facsimile transmission as "DRAFT" if it is not to be considered as an official response.

9. Any inquiry concerning this communication should be directed to Examiner Eric Compton at telephone number (703) 305-0240.

ebc

May 21, 2002


S. THOMAS HUGHES
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700